Innovative Service Around the Globe YAGEO

DATA SHEET

GENERAL PURPOSE CHIP RESISTORS

RC0805 (Pb Free)

5%; 1%

YAGEO

Product specification – Sep 03, 2004 V.2

SCOPE

This specification describes RC0805 series chip resistors with lead-free terminations made by thick film process.

ORDERING INFORMATION

Part number is identified by the series, size, tolerance, packing type, temperature coefficient, taping reel and resistance value.

YAGEO ORDERING CODE

CTC CODE

RC0805 X X X XX XXXX L
(1) (2) (3) (4) (5) (6)

(1) TOLERANCE

F = ±1%
J = ±5%

(2) PACKAGING TYPE

R = Paper/PE taping reel

(3) TEMPERATURE COEFFICIENT OF RESISTANCE

– = Base on spec

(4) TAPING REEL

07 = 7 inch dia. Reel
10 = 10 inch dia. Reel (not preferred)
13 = 13 inch dia. Reel

(5) RESISTANCE VALUE

5R6, 56R, 560R, 5K6, 56K, 22M.

(6) RESISTOR TERMINATIONS

L = Lead free terminations (pure Tin)

ORDERING EXAMPLE

The ordering code of a RC0805 chip resistor, value 56 Ω with ±1% tolerance, supplied in 7-inch tape reel is: RC0805FR-0756RL.

NOTE

1. The "L" at the end of the code is only for ordering. On the reel label, the standard CTC will be mentioned an additional stamp "LFP"= lead free production.
2. Products with lead in terminations fulfil the same requirements as mentioned in this datasheet.
3. Products with lead in terminations will be phased out in the coming months (before July 1st, 2006)

MARKING

RC0805

Fig. 1 Value=10 KΩ

E-24 series: 3 digits

First two digits for significant figure and 3rd digit for number of zeros

Fig. 2 Value=10 KΩ

Both E-24 and E-96 series: 4 digits

First three digits for significant figure and 4th digit for number of zeros

For marking codes, please see EIA-marking code rules in data sheet "Chip resistors instruction".

CONSTRUCTION

The resistors are constructed out of a high-grade ceramic body. Internal metal electrodes are added at each end and connected by a resistive paste. The composition of the paste is adjusted to give the approximate required resistance and laser cutting of this resistive layer that achieves tolerance trims the value. The resistive layer is covered with a protective coat and printed with the resistance value. Finally, the two external terminations (pure Tin) are added. See fig. 3.

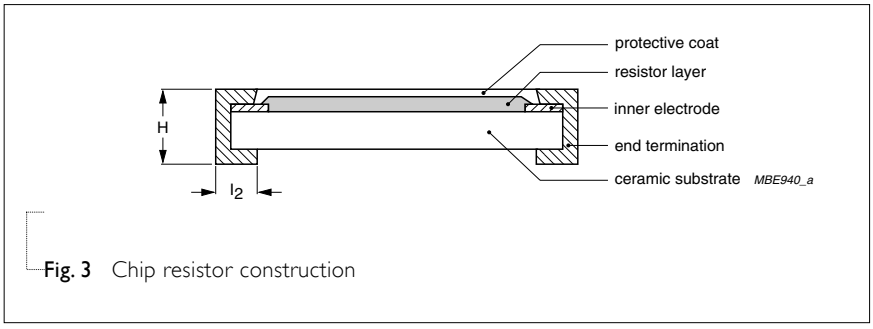

Fig. 3 Chip resistor construction

DIMENSIONS

Table 1

TYPE	RC0805
L (mm)	2.00 ±0.10
W (mm)	1.25 ±0.10
H (mm)	0.50 ±0.10
l_1 (mm)	0.35 ±0.20
l_2 (mm)	0.35 ±0.20

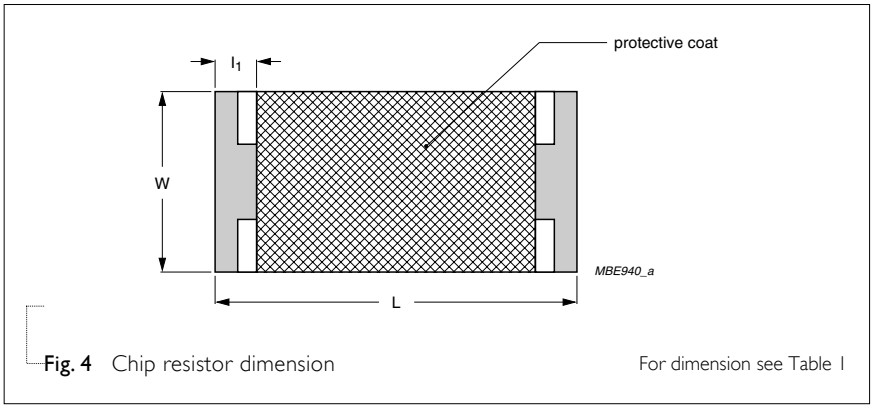

Fig. 4 Chip resistor dimension

For dimension see Table 1

ELECTRICAL CHARACTERISTICS

Table 2

CHARACTERISTICS		RC0805 1/8 W
Operating Temperature Range		–55 °C to +155 °C
Maximum Working Voltage		150 V
Maximum Overload Voltage		300 V
Dielectric Withstanding Voltage		300 V
Resistance Range	5% (E24)	1 Ω to 22 MΩ
	1% (E96)	1 Ω to 10 MΩ
	Zero Ohm Jumper	< 0.05 Ω
Temperature Coefficient	10 Ω < R ≤ 10 MΩ	±100 ppm/°C
	R ≤ 10 Ω; R > 10 MΩ	±200 ppm/°C
Jumper Criteria	Rated Current	2.0 A
	Maximum Current	5.0 A

FOOTPRINT AND SOLDERING PROFILES

For recommended footprint and soldering profiles, please see the special data sheet "Chip resistors mounting".

ENVIRONMENTAL DATA

For material declaration information (IMDS-data) of the products, please see the separated info "Environmental data".

PACKING STYLE AND PACKAGING QUANTITY

Table 3 Packing style and packaging quantity

PRODUCT TYPE	PACKING STYLE	REEL DIMENSION	QUANTITY PER REEL
RC0805	Paper / PE Taping Reel (R)	7" (178 mm)	5,000 units
		10" (254 mm) / not preferred	10,000 units
		13" (330 mm)	20,000 units

NOTE

1. For Paper/PE tape and reel specification/dimensions, please see the special data sheet "Packing" document.

FUNCTIONAL DESCRIPTION

POWER RATING

RC0805 rated power at 70°C is 1/8 W

RATED VOLTAGE

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:

$V=\sqrt{(P \times R)}$

Where

V=Continuous rated DC or AC (rms) working voltage (V)

P=Rated power (W)

R=Resistance value (Ω)

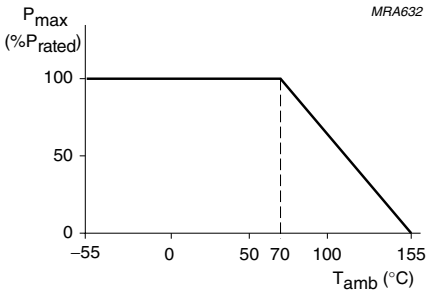

Fig. 5 Maximum dissipation (P_{max}) in percentage of rated power as a function of the operating ambient temperature (T_{amb})

PULSE LOADING CAPABILITIES

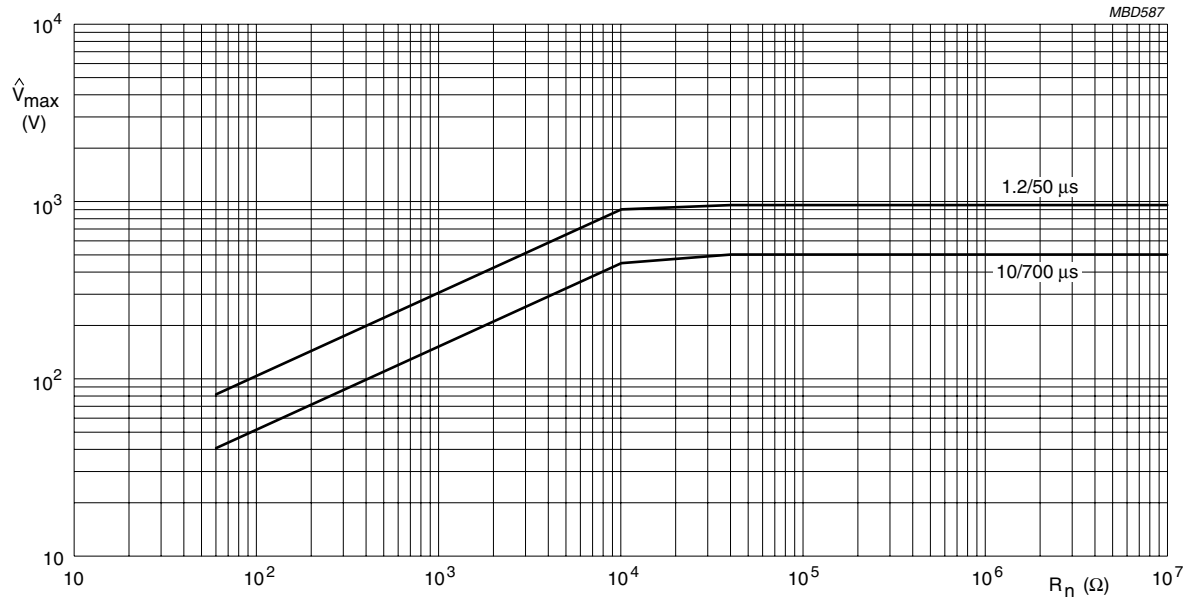

Fig. 6 Maximum permissible peak pulse voltage without failing to open circuit' in accordance with DIN IEC 60040 (CO) 533 for type: RC0805

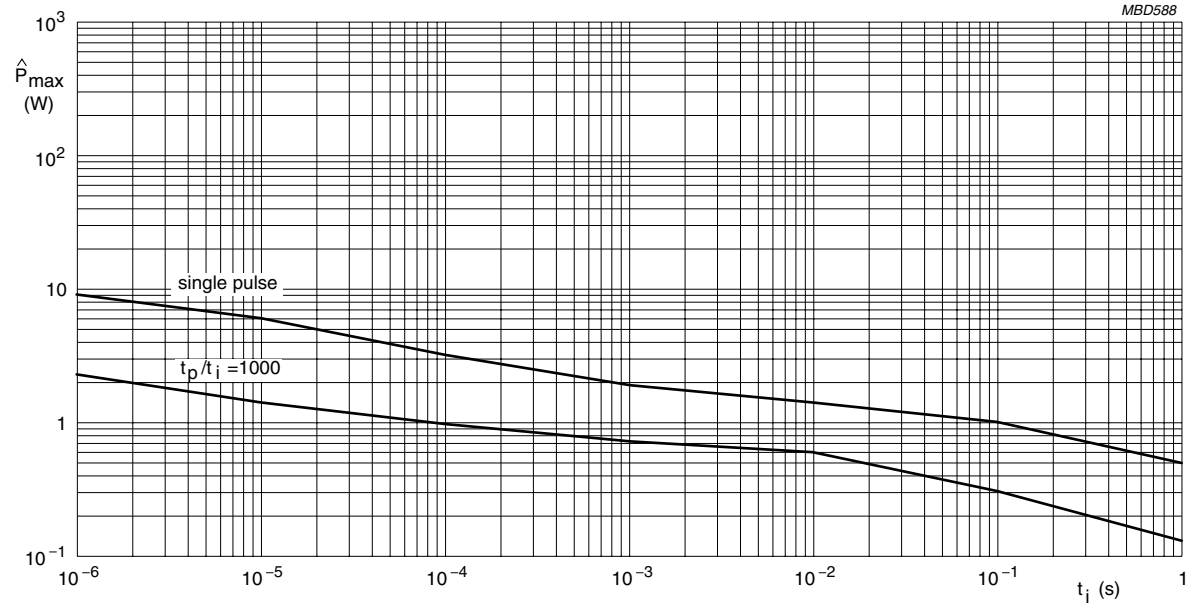

Fig. 7 Pulse on a regular basis for type: **RC0805**; maximum permissible peak pulse power as a function of pulse duration for single pulse and repetitive pulse tp/ti = 1000

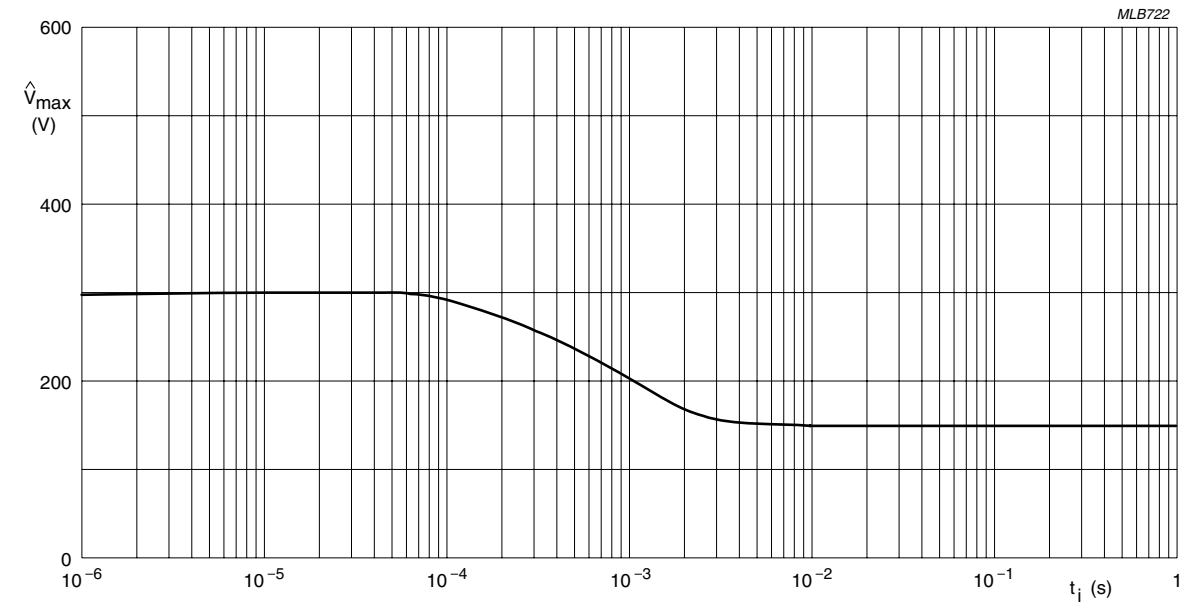

Fig. 8 Pulse on a regular basis for type: **RC0805**; maximum permissible peak pulse voltage as a function of pulse duration

TESTS AND REQUIREMENTS

Table 4 Test condition, procedure and requirements

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Temperature Coefficient of Resistance (T.C.R.)	MIL-STD-202F-method 304; JIS C 5202-4.8	At +25/–55 °C and +25/+125 °C **Formula:** $T.C.R=\frac{R_2-R_1}{R_1(t_2-t_1)}\times 10^6$ (ppm/°C) Where t_1=+25 °C or specified room temperature t_2=–55 °C or +125 °C test temperature R_1=resistance at reference temperature in ohms R_2=resistance at test temperature in ohms	Refer to table 3
Thermal Shock	MIL-STD-202F-method 107G; IEC 60115-1 4.19	At –65 (+0/–10) °C for 2 minutes and at +155 (+10/–0) °C for 2 minutes; 25 cycles	±(0.5%+0.05 Ω) for 1% tol. ±(1.0%+0.05 Ω) for 5% tol.
Low Temperature Operation	MIL-R-55342D-Para 4.7.4	At –65 (+0/–5) °C for 1 hour; RCWV applied for 45 (+5/–0) minutes	±(0.5%+0.05 Ω) for 1% tol . ±(1.0%+0.05 Ω) for 5% tol. No visible damage
Short Time Overload	MIL-R-55342D-Para 4.7.5; IEC 60115-1 4.13	2.5 × RCWV applied for 5 seconds at room temperature	±(1.0%+0.05 Ω) for 1% tol. ±(2.0%+0.05 Ω) for 5% tol. No visible damage
Insulation Resistance	MIL-STD-202F-method 302; IEC 60115-1 4.6.1.1	RCOV for 1 minute Type: RC0805 Voltage (DC): 300 V	≥10 GΩ
Dielectric Withstand Voltage	MIL-STD-202F-method 301; IEC 60115-1 4.6.1.1	Maximun voltage (V_{rms}) applied for 1 minute Type: RC0805 Voltage (AC): 300 V_{rms}	No breakdown or flashover
Resistance to Soldering Heat	MIL-STD-202F-method 210C; IEC 60115-1 4.18	Unmounted chips; 260 ±5 °C for 10 ±1 seconds	±(0.5%+0.05 Ω) for 1% tol. ±(1.0%+0.05 Ω) for 5% tol. No visible damage
Life	MIL-STD-202F-method 108A; IEC 60115-1 4.25.1	At 70±2 °C for 1,000 hours; RCWV applied for 1.5 hours on and 0.5 hour off	±(1%+0.05 Ω) for 1% tol. ±(3%+0.05 Ω) for 5% tol.

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Solderability	MIL-STD-202F-method 208A; IEC 60115-1 4.17	Solder bath at 245±3 °C Dipping time: 2±0.5 seconds	Well tinned (≥95% covered) No visible damage
Bending Strength	JIS C 5202.6.14; IEC 60115-1 4.15	Resistors mounted on a 90 mm glass epoxy resin PCB (FR4) Bending: 5 mm	±(1.0%+0.05 Ω) for 1% tol. ±(1.0%+0.05 Ω) for 5% tol. No visible damage
Resistance to Solvent	MIL-STD-202F-method 215; IEC 60115-1 4.29	Isopropylalcohol (C_3H_7OH) or dichloromethane (CH_2Cl_2) followed by brushing	No smeared
Noise	JIS C 5202 5.9; IEC 60115-1 4.12	Maximum voltage (V_{rms}) applied.	Resistors range: Value R < 100 Ω: 10 dB 100 Ω ≤ R < 1 KΩ: 20 dB 1 KΩ ≤ R < 10 KΩ: 30 dB 10 KΩ ≤ R < 100 KΩ: 40 dB 100 KΩ ≤ R < 1 MΩ: 46 dB 1 MΩ ≤ R ≤ 22 MΩ: 48 dB
Humidity (steady state)	JIS C 5202 7.5; IEC 60115-8 4.24.8	1,000 hours; 40±2 °C; 93(+2/–3)% RH RCWV applied for 1.5 hours on and 0.5 hour off	±(0.5%+0.05 Ω) for 1% tol. ±(2.0%+0.05 Ω) for 5% tol.
Leaching	EIA/IS 4.13B; IEC 60115-8 4.18	Solder bath at 260±5 °C Dipping time: 30±1 seconds	No visible damage
Intermittent Overload	JIS C 5202 5.8	At room temperature; 2.5 × RCWV applied for 1 second on and 25 seconds off; total 10,000 cycles	±(1.0%+0.05 Ω) for 1% tol. ±(2.0%+0.05 Ω) for 5% tol.
Resistance to Vibration	On request	On request	
Moisture Resistance Heat	MIL-STD-202F-method 106F; IEC 60115-1 4.24.2	42 cycles; total 1,000 hours Shown as figure 9	±(0.5%+0.05Ω) for 1% tol. ±(2.0%+0.05Ω) for 5% tol. No visible damage

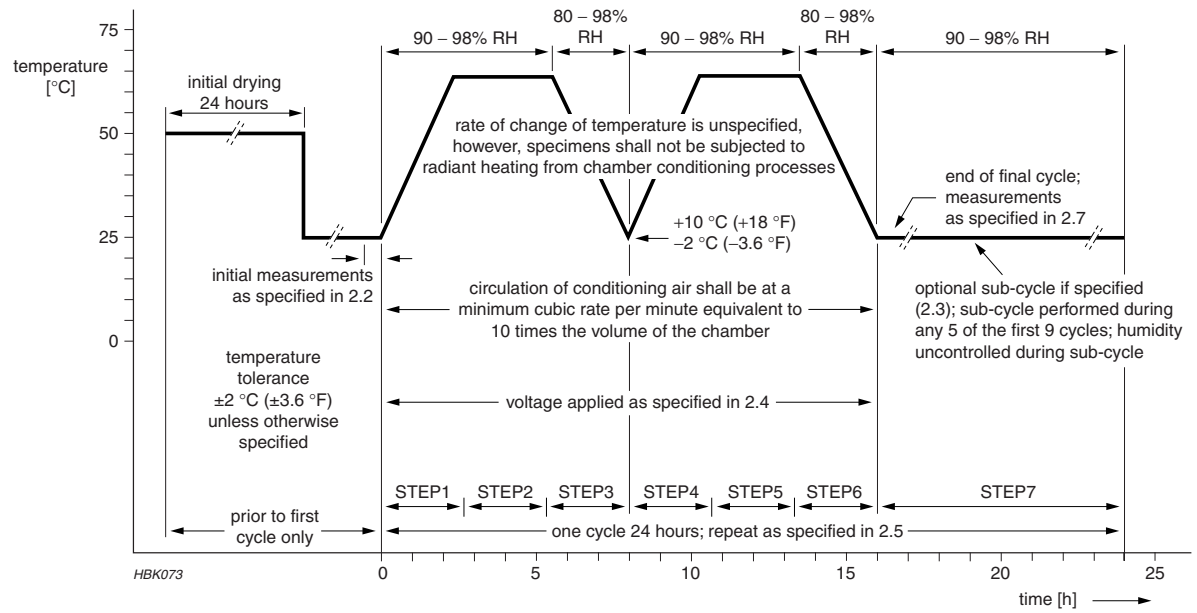

Fig. 9 Moisture resistance test requirements

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 2	Sep 03, 2004	-	- Test method and procedure updated - PE tape added (paper tape will be replaced by PE tape)

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Yageo:

RC0805FR-07100KL RC0805FR-07100RL RC0805FR-07105RL RC0805FR-0710K2L RC0805FR-0710K7L RC0805FR-0710ML RC0805FR-0710RL RC0805FR-0711K3L RC0805FR-0711K5L RC0805FR-0711KL RC0805FR-0711RL RC0805FR-07121KL RC0805FR-07121RL RC0805FR-07124RL RC0805FR-07127RL RC0805FR-0712K4L RC0805FR-0712K7L RC0805FR-0712R1L RC0805FR-07133RL RC0805FR-0713KL RC0805FR-07140RL RC0805FR-07147RL RC0805FR-0714KL RC0805FR-07150KL RC0805FR-07150RL RC0805FR-07158RL RC0805FR-0715KL RC0805FR-0715RL RC0805FR-07162RL RC0805FR-0716K5L RC0805FR-07178RL RC0805FR-0717K8L RC0805FR-07182KL RC0805FR-07187RL RC0805FR-0718K2L RC0805FR-0718K7L RC0805FR-0718R2L RC0805FR-07196RL RC0805FR-071K02L RC0805FR-071K13L RC0805FR-071K1L RC0805FR-071K21L RC0805FR-071K2L RC0805FR-071K33L RC0805FR-071K3L RC0805FR-071K43L RC0805FR-071K47L RC0805FR-071K54L RC0805FR-071K5L RC0805FR-071K62L RC0805FR-071K96L RC0805FR-071ML RC0805FR-071R62L RC0805FR-071RL RC0805FR-07200KL RC0805FR-07200RL RC0805FR-07205KL RC0805FR-0720K5L RC0805FR-0720KL RC0805FR-0720RL RC0805FR-07215KL RC0805FR-07215RL RC0805FR-0721K5L RC0805FR-0721KL RC0805FR-0721R5L RC0805FR-07221KL RC0805FR-07226KL RC0805FR-0722K1L RC0805FR-0722K6L RC0805FR-0722R1L RC0805FR-07232RL RC0805FR-07243RL RC0805FR-07249KL RC0805FR-07249RL RC0805FR-0724K3L RC0805FR-07255RL RC0805FR-07267KL RC0805FR-07267RL RC0805FR-0726K1L RC0805FR-0726R1L RC0805FR-07274KL RC0805FR-07274RL RC0805FR-0727K4L RC0805FR-07280RL RC0805FR-0728K7L RC0805FR-072K05L RC0805FR-072K15L RC0805FR-072K21L RC0805FR-072K26L RC0805FR-072K49L RC0805FR-072K55L RC0805FR-072K61L RC0805FR-072K74L RC0805FR-072KL RC0805FR-072M2L RC0805FR-072ML RC0805FR-072R2L RC0805FR-072R37L RC0805FR-072R61L RC0805FR-072R74L